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CONDITIONING THROUGH VICARIOUS INSTIGATION

SEYMOUR M. BERGER[1]
Indiana University

Personality theorists and social psychologists generally recognize that the emotional responses of one person (performer) may elicit emotional responses from another (observer). When these emotional responses are similar, the relationship between the performer and observer is described as *empathetic,* or one of *identification.* If the relationship is one of *envy,* the performer's pleasure elicits an unpleasant emotional reaction from the observer. In a *sadistic* (malicious joy) relationship, the performer's displeasure elicits a joyful response from the observer. In all of these relationships, the observer's emotional response is dependent upon the emotional response of the performer. As social phenomena, empathy, envy, and sadism require that the observer experience the emotion of the performer *vicariously,* in the sense of perceiving it, as a prelude to the observer's own emotional response.

The purpose of this paper is to provide a conceptual framework within which to study empathy, envy, and sadism as determinants of interpersonal behavior. For example, empathy may account for certain forms of altruism, envy for the loss of friendship, and sadism for malicious mischief. Before proceeding to these problems, however, it is necessary to identify a basic mechanism in the arousal of the observer's emotional response.

Vicarious Instigation

If an observer responds emotionally to a performer's unconditioned emotional response (UER) then vicarious instigation has occurred.[2] The performer's UER requires more precise definition. It is meant to refer to the performer's emotional state, following the presentation of an unconditioned stimulus (UCS), *as perceived by the observer.* The actual state of the performer is not directly observable. The observer must infer the performer's UER from observable events in the environment. Typically, the observer will rely upon the UCS and the performer's overt unconditioned response (UCR) as cues to the performer's UER. Consequently, the performer's UCS and UCR are important determining factors in vicarious instigation.

The performer's UER need not actually occur, the observer may infer it (incorrectly) from the situational context. It is only necessary that the observer perceive that the performer's UER has occurred, and respond emotionally, for vicarious instigation. A mother, for example, may react with fear and anguish when she sees her child fall, only to find that the child is unhurt and undisturbed. In this example, the mother's emotional response (ER) was dependent upon her perception of what had happened to her child (the UCS) rather than the child's reaction (UCR). She misperceived the child's emotional state in this case, yet she was vicariously instigated; she inferred the child's UER from the

[1] The author wishes to express his indebtedness to at least two colleagues, Marvin Levine and Leon H. Levy, for their encouragement, many helpful suggestions, and critical reading of the manuscript.

[2] Throughout this paper, the term *unconditioned* refers to dependable S-R relationships which serve as a basis for conditioning. This usage is in agreement with the definition employed by many writers in the area of conditioning (e.g., Hilgard & Marquis, 1961, pp. 46–47). In this procedural sense, the term unconditioned may refer to either learned or unlearned S-R relationships.

UCS only. Had she been in another room and heard the child cry (UCR), the mother might have inferred that her child was in pain (UER) without knowledge of the precipitating event (UCS), and yet would have been vicariously instigated. While the performer's UCS and UCR are important cues for vicarious instigation, both are not always necessary for vicarious instigation.

Pseudovicarious Instigation

The simple contiguity between the performer's UCS and UCR and the observer's ER is not sufficient evidence for vicarious instigation, however. Since the observer's ER follows the performer's UCS and UCR, the observer may appear to be responding to the performer's UER when in actuality he is responding to some other stimulus component in the situation. As indicated above, vicarious instigation is dependent upon the performer's UCR or the UCS. In some situations, however, the observer may respond to the UCS only, so that the performer's UER is superfluous. An observer may respond with fear to the firing of a gun, regardless of whether the target is a bull's-eye or another human being. The observer's fear is not vicariously instigated in this instance—although it may appear to be if the target happens to be another human being.

Another possible source of pseudovicarious instigation is the performer's UCR. The performer's UCR may be a UCS which elicits an observer ER; in this case, the observer responds to the performer's UCR only, so that the performer's UCS and UER are superfluous. A sudden loud scream by a performer, for example, may elicit a fear response from the observer independently of his response to the performer's UCS or UER. Recent studies by Church (1959) and Murphy, Miller, and Mirsky (1955) have demonstrated how a rat's squeal and a monkey's presence, respectively, may serve as a conditioned fear stimulus.

The performer's UER may serve as a discriminative stimulus which indicates to the observer that he will receive the UCS that is presented to the performer. This is another source of pseudovicarious instigation. One child may fear that he will be spanked when he sees that his brother is being spanked for no apparent reason. It is not his brother's cries in response to the spanking that elicit the child's fear, rather it is the anticipation of being spanked himself.

The following study by Barnett and Benedetti (1960) illustrates a form of pseudovicarious instigation which may occur in conditioning. In this case, an extraneous stimulus in the situation served as a UCS:

After adapting the GSR of an observer to a buzzer, the authors had him watch a performer undergoing GSR conditioning, with shock as the UCS and the buzzer as the conditioned stimulus (CS). Even though most observers were not aware that the performer was being shocked, they responded with GSRs to the buzzer on test trials. Subsequent experimentation concerning the various stimulus components of the situation led the authors to conclude that what appeared to be "vicarious conditioning" (their term) involved responses to visible needle deflections of the galvanometer, even in the absence of the performer; the GSRs, in this case, reflecting changes in activation level following the occurrence of a stimulus change, i.e., needle movements.

All of these situations are not instances of vicarious instigation, although they would appear to be in casual observation. Obviously, therefore, anecdotal evidence for vicarious instigation is of dubious value, and an experimental analysis is required to eliminate the possibility of pseudovicarious instigation.

Concordant and Discordant Forms [3]

The definition of vicarious instigation requires that the observer respond emotionally to the performer's UER, but there is no restriction placed upon the nature of these emotional responses. As indicated previously, there may be a certain similarity or dissimilarity between the emotional responses of the performer and observer. Concordant vicarious instigation takes place when performer and observer responses are similar [4]; discordant vicarious instigation occurs when performer and observer responses are dissimilar. An examination of concordant and discordant forms of vicarious instigation provides a rudimentary classification system for empathy, envy, and sadism.

If discussion is limited to the elicitation of emotional responses which may be classified as either pleasant (+) or unpleasant (−), it is possible to specify the necessary conditions for empathy, envy, and sadism. The four possible combinations of pleasant and unpleasant emotional responses for performer and observer are presented in Table 1. It should be noted that throughout this discussion, the classification of the performer's UER is in terms of the observer's perception of it.

TABLE 1

COMBINATIONS OF EMOTIONAL RESPONSES FOR PERFORMER AND OBSERVER

Case	Performer's UER	Observer's ER
I	+	+
II	+	−
III	−	+
IV	−	−

Empathy may be defined by Cases I and IV; shocking the performer (−) may be painful (−) for the observer, for example. *Envy* may be defined by Case II; rewarding the performer (+) may instigate a feeling of depression in the observer (−). *Sadism* may be defined by Case III; shocking the performer (−) may elicit joy in the observer (+).

Although these combinations of performer and observer responses seem to identify the *necessary* conditions for characterizing empathy, envy, and sadism, the present scheme does not include the *sufficient* conditions for complete characterization.

Nevertheless, this initial effort suggests a useful direction to pursue in order to bring a wider variety of emotional responses within the scope of conditioning theory.

Conditioning

As a motivational concept, vicarious instigation has relevance to a variety of social behaviors acquired through classical and instrumental conditioning. In the discussion which follows, an attempt is made to identify two conditioning models in which social learning is a function of vicarious instigation.

[3] Although not specifically concerned with the problem of conditioning, Heider (1958, Ch. 11) has presented an analysis which describes one person's reactions "to the lot of the other." There are some parallels between the analysis of conditioning through vicarious instigation and Heider's presentation. The present analysis attempts to deal with similar problems, but in terms of conditioning models.

[4] Some authors (e.g., Asch, 1952, p. 171; Heider, 1958, pp. 279–282) distinguish between two forms of concordant emotional response. The observer may react concordantly with the performer's response to the unconditioned stimulus (UCS) and in a manner that is concordant with the way that the observer would react if he had been directly instigated; the observer may react concordantly with the performer's response to the UCS, but in a manner that is discordant with the way the observer would react if he had been directly instigated. In the former instance, the observer is reacting emphathetically, while in the latter instance the observer is reacting sympathetically. This distinction, while useful for some purposes, will be disregarded in this paper because it does not advance the present analysis.

CLASSICAL CONDITIONING PARADIGM: THE PERFORMER'S UER AS A UCS

In classical conditioning, in order for a response to become conditioned to a neutral stimulus (CS), the response must be elicited by the UCS. Any stimulus may serve as the UCS if it will elicit a given response with some degree of regularity. In vicarious instigation, the performer's UER serves as a UCS for the observer's ER.

The distinction between vicarious instigation and conditioning may be illustrated as follows: Haner and Whitney (1960) had an observer watch a performer who supposedly was being shocked each time a light was presented. The authors found that this situation elicited GSRs from the observers, the GSR size being positively related to the general anxiety level of the observer. But no test was made to determine whether the observer's GSRs became conditioned to the light alone. While Haner and Whitney call this phenomenon "empathic conditioning," the term vicarious instigation seems more appropriate.

In the classical conditioning model, vicarious instigation must occur in contiguity with a CS. Conditioning occurs when the CS comes to elicit the observer's ER in the absence of the performer's UER. While this model may be applied to a variety of social learning situations, an example of concordant vicarious instigation in the formation of attitudes may be found in this excerpt from Gordon W. Allport (1935):

> Even before he has an adequate background of appropriate experience, a child may form many intense and lasting attitudes toward races and professions, toward religion and marriage, toward foreigners and servants, and toward morality and sin. A parent's tone of voice in disapproving of ragamuffins who live along the railroad track is enough to produce an uncritical attitude in *the child who has no basis in his experience for the rational adoption of the parent's point of view* [italics added]. It frequently happens that *subsequent* experience is fitted into the attitude thus uncritically adopted, not . . . made the basis for the attitude. In such cases every contact is prejudged, contradictory evidence is not admitted, and the attitude which is *borrowed secondhand* [italics added] is triumphant (p. 811).

In terms of the model, the "ragamuffins" are the CS, the parent's UER is inferred from the disapproving tone of voice, and the child's uncritical negative attitude is the observer's ER. Once the emotional component of the attitude is conditioned ("borrowed secondhand"), the cognitive elements are added by subsequent experience.

Although attitudes are formed in a variety of ways, the present model provides a conceptual and experimental basis for studying the transmission of ready-made attitudes through observational learning in a classical conditioning framework. One can only speculate concerning the variety of social experiences that may be transmitted in this way.

INSTRUMENTAL CONDITIONING PARADIGM: VICARIOUS INSTIGATION AS A REINFORCEMENT

Vicarious instigation may serve as either a positive or negative reinforcement for observer responses in instrumental conditioning situations. Each type of reinforcement will be considered separately.

As a positive reinforcement, vicarious instigation strengthens the observer responses it follows. It is assumed that a positive ER is instigated in the observer. Therefore, pleasant empathetic feelings or malicious joy would be the basis for the positive reinforcement. Altruism, for example, is assumed to be based upon concordant vicarious instigation where both performer and observer emotional responses are positive. To illustrate, I may become more charitable when my

gift is received with obvious pleasure by the recipient. If perceiving the pleasure of the recipient is vicariously instigating, it may reinforce my charitable behavior. Of course, sources of pseudovicarious instigation would have to be controlled, since charitable behavior may be reinforced by approval I receive from the recipient or from my family and friends.

"Tattletale" behavior is an example of how a sadistic relationship may affect conditioning. One child may learn that he can have his rival punished by disclosing the rival's misdeeds to his mother. Presumably, the enjoyment elicited by this rival's punishment reinforces the tattletale behavior. Again, experimental analysis is necessary to eliminate pseudoeffects; e.g., the child may be seeking the approval of the mother and a raise in his own status.

Vicarious instigation may function as a negative reinforcement if responses are strengthened when followed by the removal or reduction of vicarious instigation. If it is assumed that emotional states have motivating properties then, following Miller's (1948) paradigm, vicariously instigated emotions may function to initiate learning; furthermore, the observer will acquire responses which reduce the emotional drive stimulus.

The performer's UER may instigate the observer's ER (assumed to be negative). The observer's ER is the drive stimulus which instigates other responses. If one of these other responses is followed by the removal of the performer's UER, vicarious instigation is terminated, and so is the observer's ER. The response which was followed by the termination of vicarious instigation will be strengthened.

This model seems applicable to situations when the vicariously instigated emotion is negative. Consequently, both unpleasant empathetic feelings and feelings of envy can function as drive stimuli in this model. Consider, for example, the starving beggar who comes to the door for a handout. The housewife may feel grief at the sight of the emaciated beggar and upon hearing his plea. She may be able to reduce her grief by shutting the door to remove the pitiful figure from her view. In this case, the beggar's state (performer's UER) aroused the housewife's grief (observer's ER) which was reduced by shutting the door. Presumably, the response of shutting the door was effective in reducing the feeling of grief and was reinforced. There are, of course, other potential sources of reinforcement in this type of situation. For example, the housewife may feel threatened by the presence of a stranger at her door, and may shut the door to insure her own safety. Clearly, sources of pseudoeffects must be ruled out before it can be concluded that the behavior was a function of vicarious instigation.

Envy may also function as a drive stimulus in this model of conditioning. One man may be envious when his rival is promoted, and attempt to reduce his feelings of mortification by subsequently avoiding all encounters with his rival. Again, it should be noted that an analysis for pseudovicarious instigation must be made (e.g., the man may be responding to his loss of the promotion rather than his rival's good fortune) before concluding that vicarious instigation is the basis for the behavior.

A number of writers (e.g., Berger, 1961; Campbell, 1961; Hill, 1960; Sechrest, 1961) have used the term *vicarious reinforcement* to describe learning phenomena. The present model identifies vicarious instigation as a possible basis for vicarious reinforcement.

AN EXPERIMENTAL DEMONSTRATION OF VICARIOUS INSTIGATION IN CLASSICAL CONDITIONING [5]

The foregoing analysis has employed anecdotal evidence and hypothetical examples to illustrate and support the conceptual framework. In light of the discussion of pseudovicarious instigation, an experimental analysis is imperative, yet lacking. Since vicarious instigation is crucial to the framework, demonstrations seemed in order. As a starting point, the author selected the classical conditioning model as a basis for demonstrating vicarious instigation in learning.

Although developed independently, the general setting for the experiments to be reported is similar to the situations used by Haner and Whitney (1960) and Barnett and Benedetti (1960). In this situation, an observer watches a performer (actually a confederate of the experimenter, who supposedly is being shocked every time a light dims. The dimming of the light is preceded by a buzzer. The GSRs of the observer are recorded as a measure of his ER. Everytime the light dims and the performer is supposedly shocked, he jerks his arm from the inductorium.[6] The buzzer was the CS. The performer's UER was inferred from the dimming of the light and electric shock (performer's UCS) and the performer's arm movement (performer's UCR). Presumably, if the observer responded with a GSR on conditioning trials, vicarious instigation occurred. It was necessary, of course, to introduce pseudovicarious instigation controls.

The previous discussion of pseudovicarious instigation suggested three general sources of pseudovicarious instigation: The performer's response, per se; the performer's UCS, per se; and the observer's anticipation that the UCS will be presented to him.

EXPERIMENT I

In an initial experiment, an attempt was made to obtain information concerning the effectiveness of the experimental situation for vicarious instigation, and to determine if the instigation of observer GSRs by apparent shock to the performer was due to the performer's response, per se. The experiment contained two conditions:

1. Shock-Movement (S-M)—the observer was told that the performer would be shocked and the performer reacted with an arm movement when apparently being shocked.

2. No Shock-Movement (NS-M)—the observer was told that the performer would make a voluntary arm movement at a given signal (light dimming), and that the performer was not being shocked.

If no differences were found between these conditions, then it would appear that observers were responding solely to the performer's movement, and that the performer's UER was not a determining factor. If differences were found, where S-M observers were more responsive, then some support would be provided for the phenomenon of vicarious instigation.

Fifteen subjects were assigned at random to each condition. The performer (a male confederate of the experimenter who appeared to be just another subject recruited for the experiment) was the same for all

[5] The author wishes to express his appreciation to Indiana University for an equipment grant in support of this research, and to Neil Schneiderman, Susan Kroener, and Patricia Stewart who were the performers and scorers in these studies. The experimenter for Experiment I was the author, Patricia Stewart was the experimenter in Experiment II, Susan Kroener was the experimenter in Experiment III.

[6] The performer jerked his arm rapidly, as a twitch. The performer tried not to make other movements, or change facial expression.

subjects. In order to avoid any systematic bias in the performer's behavior, the instructions regarding the different conditions were read to the observer before the performer appeared for the experiment. For observers in the S-M condition, the experimenter explained that another subject would be shocked in the last part of the experiment, and that he would be a few minutes late because the experimenter's assistant was testing the other subject to see what level of shock he could take; for observers in the NS-M condition, the performer's initial absence was explained on the basis that the experimenter's assistant was giving the other subject practice in making the arm movement. Instructions, which were common to both conditions and did not reveal the specific nature of the condition, were read aloud when performer and observer were present together.

The experiment was described to the observer as an attempt to determine whether different kinds of stimulation (buzzer and light diming) produced different types of skin resistance changes. S-M observers were told that the performer would be shocked every time the light dimmed in order to determine the effect of shock on the performer's GSR. The observer was reassured that he was a control subject and would not be shocked at any time. NS-M observers were told that the performer would try to jerk his hand off the apparatus in front of him every time the light dimmed to see if the movement affected his GSR. The observer was told that he was a control subject and that no one would be shocked.

Although the experimenter appeared to be taking readings from both the performer and observer, only the observer's GSRs were recorded. After an initial adaptation period, in which the buzzer was presented for 1.0 second followed immediately by dimming of the light for 1.0 second, the performer's hand was strapped to the inductorium in front of him. It was only during this latter phase of the experiment that the performer made arm movements.

There were 13 trials during this phase of the experiment. Ten trials were used for conditioning, with 3 test trials interspersed in the same position for all subjects. The intertrial interval was 15 seconds.

The method of moving averages with blocks of three trials was used for all curves presented in this paper, using the number of observers giving a GSR on given trials as the dependent response measure. For purposes of statistical analysis, the total number of GSRs for each observer, for a given set of trials, was used as the dependent response measure in all experiments.

Three criteria were used to identify a GSR response:

1. The movement of the recording pen had to be in the direction of lowered resistance.
2. The movement had to be at least as large as twice the thickness of the recording pen line.
3. The movement had to occur within 4 seconds following the termination of the buzzer.

The records were scored independently by the experimenter and the confederate, although both had some knowledge as to which conditions given observers had been assigned. The scorers agreed on 94% of the trials concerning whether or not a GSR had occurred; disagreements were resolved by re-examination and discussion by the scorers.

The criterion for adaptation during the first phase of the experiment was two successive no response trials; all observers were given a minimum of four adaptation trials, however. The adaptation curves over the four trials are presented in Figure 1. While it is apparent from Figure 1 that subjects in the S-M condition were less responsive than subjects in the NS-M condition, a comparison of the total number of individual responses over the four adaptation trials for each condition by the Mann-Whitney U test revealed no reliable differences ($U = 81.5$).[7]

The relative effectiveness of the two conditions to instigate observer GSRs may be examined in the "conditioning" section of Figure 1. The total scores for individual observers in the two conditions (on trials in which the confederate responded) were compared by the Mann-Whitney U test. S-M observers appear to be more responsive

[7] Two-tailed tests are used throughout this paper. The Mann-Whitney test was employed in Experiment I because the comparison groups differed significantly in variance (uncorrectable by usual transformation techniques) and, at the same time, appeared to have differently shaped distributions. The data for Experiments II and III were more amenable to analysis of variance according to the criteria suggested by Boneau (1960).

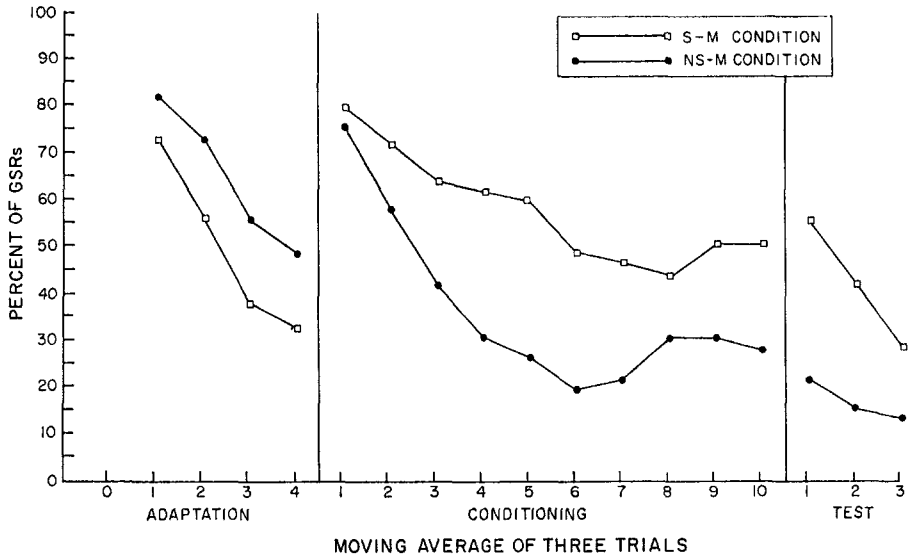

FIG. 1. Percentage of observers giving GSRs during adaptation, conditioning, and test trials (Experiment I).

than NS-M observers, but the difference is not reliable ($U = 70.5, p < .10$).

The total number of GSRs over the three test trials was obtained for each observer and the Mann-Whitney U test was used to compare the differences between the conditions. The "test trial" section of Figure 1 shows that S-M observers gave more responses on test trials than NS-M observers. The total score differences were reliable at less than the .05 level ($U = 61.5$).

A post-experiment questionnaire revealed that most observers gave descriptions of the performer's situation which were in agreement with the experimental instructions. Two NS-M observers reported that the performer might be receiving a shock. One observer in each condition reported some expectation of receiving shock.

These results lend support to the notion that conditioning can occur through vicarious instigation. While the arousal effects of the arm movement are apparent from the data, there is some tendency for GSR instigation to occur more frequently when the observer is told that the performer is being shocked. Furthermore, the frequency of conditioned responses (CRs) is reliably greater in the S-M condition. Conditioning was not solely a function of the performer's response, but was dependent upon the instructions concerning shock.

EXPERIMENT II

The encouraging results of Experiment I testified to the utility of the experimental setting in studying vicarious instigation. Yet, Experiment I contained only two pseudovicarious instigation controls; i.e., the NS-M condition, for performer response, and the instructions to the observer that he would not be shocked. A third control is necessary to determine whether the performer's UCS per se, will account for the differences obtained. It is conceivable that S-M observer's were affected solely by the instructions concerning shock, and that the performer's response was not a contributing factor; or, that the apparent presence of elec-

tricity in the inductorium had arousal effects which were independent of the performer *being* shocked. Since the differences between the movement conditions for instigations was not reliable in Experiment I, a complete 2 × 2 factorial design involving shock and movement was employed in this experiment. This design provided for the various pseudovicarious instigation controls. The four conditions of this experiment are identified as follows:

1. S-M—Shock to performer, and performer arm movement.
2. S-NM—Shock to performer, but no performer arm movement.
3. NS-M—No shock to performer, but performer arm movement.
4. NS-NM—No shock to performer, and no performer arm movement.

The S-M and NS-M conditions were the same conditions used in Experiment I. The S-NM condition is a "UCS control" for the instructions concerning shock and an electrified inductorium; the performer made no response. The NS-NM condition was another UCS control; the performer's hand was not placed on the inductorium during the conditioning phase of the experiment. She was told that she would not be shocked, and should not touch the inductorium when the light dimmed or else she would be shocked. This condition was used to assess the arousal effect of an electrified inductorium without shock to the performer.

Twenty-four subjects were assigned to each condition so that each condition contained an equal number of males and females.

A female confederate acted as the performer in this experiment. In addition to the different instructions for the various conditions, there were some procedural changes. In Experiment I, an attempt was made to use a "blind" performer by having the critical instructions for the different conditions read to the observer before the performer entered the laboratory. This procedure was abandoned in this experiment for two reasons: the performer in Experiment I frequently could identify the condition being used by the kinds of overt responses the observer made (e.g., smiling, looking away when the performer jerked, apparent boredom, etc.), and the performer in this experiment had to know what condition she was in so that she could behave appropriately.

The criteria for scoring GSRs were the same as in Experiment I, except that the pen

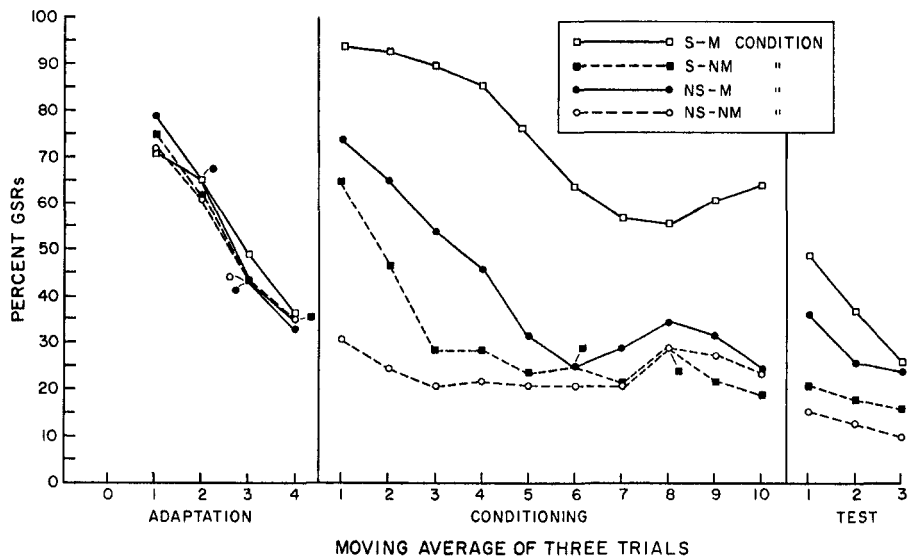

FIG. 2. Percentage of observers giving GSRs during adaptation, conditioning, and test trials (Experiment II).

movement in the direction of lowered resistance need only have been greater than the thickness of the pen line (rather than twice the thickness). This change represented an attempt to increase the sensitivity of the GSR measure, particularly with regard to CRs, which generally occurred relatively infrequently in Experiment I. Scoring was done independently, and without identification of the condition to which individual observers were assigned. The scorers agreed on 96% of the trials concerning the occurrence of GSRs; disagreements were resolved by reexamination and discussion by the scorers.

No differences in observer GSRs were observed between conditions during the adaptation period, as may be seen in Figure 2.

Table 2 summarizes the analysis of variance performed on the total scores for observers in the different conditions over the 10 conditioning trials.

Since the purpose of this study was to determine whether the differential effect of shock instructions found in Experiment I would occur without performer arm movement, the Shock × Movement interaction in the analysis of variance is particularly relevant. This interaction indicates that the differential effect of shock instructions depends upon whether or not performer arm movements are present. There is a significant difference between the frequency of GSRs given by S-M observers and the frequency of GSRs given by observers in the NS-M condition ($t = 4.33$, $df = 46$, $p < .01$); this difference is not significant between the observers in the S-NM and NS-NM conditions.

The main effect for Movement reveals that performer arm movements are effective elicitors of the GSR, regardless of shock instructions. The t between S-M and S-NM observers is 5.89, $df = 46$, $p < .01$; the t between the NS-M and NS-NM observers is 2.92, $df = 46$, $p < .01$.

The main effect for Shock is primarily due to the difference between the S-M and NS-M observers, the difference between the S-NM and NS-NM observers being small and not significant.

TABLE 2

SUMMARY OF ANALYSIS OF VARIANCE OF GSR INSTIGATION SCORES

Source	*df*	*MS*	*F*
Shock instructions	1	94.01	16.79**
Performer movement	1	219.01	39.11**
Sex of observer	1	4.60	—
Shock × Movement	1	38.76	6.92*
Shock × Sex	1	3.01	—
Movement × Sex	1	7.58	1.36
Shock × Movement × Sex	1	2.99	—
Residual	88	5.60	

*$p < .025$.
**$p < .001$.

The t tests reported above show that observers in the S-M condition differ from observers in the NS-M and S-NM conditions. The S-M observers also differ from NS-NM observers ($t = 7.35$, $df = 46$, $p < .01$).

The differences between conditions over conditioning trials may be seen in Figure 2.

The results of Experiment I suggested instigation was not solely a function of the performer's arm movement. This finding is strongly supported by the results of this experiment; a very reliable difference was found between the S-M and the NS-M conditions. In addition, this study reveals that the instructions concerning shock to the performer (S-NM condition), or that electricity is being passed to the inductorium (NS-NM condition) are not sufficient in themselves to account for the frequency of observer GSRs in the S-M condition. It is apparent from these data that frequency of instigation depends upon the instructions concerning shock and the occurrence of the performer's response.

Figure 2 also presents the test trial data for observers in four conditions. An analysis of variance of the test trials

scores revealed no reliable differences in conditioning. The order of conditions, based upon the magnitude of the means for CRs, is in line with the order of conditions based upon the means for instigations. The frequency of CRs tends to be greatest in the S-M condition, although the difference between S-M observers and observers in the other conditions was not great enough to yield statistically significant results.

Although reliable differences were found between the conditioning results from the S-M condition and the NS-M condition in Experiment I, the differences between responsiveness on test trials for these conditions in this study were not reliable, but in the same direction.

A content analysis of the post-experiment questionnaire data attempted to answer two questions: Did the observer describe the performer's actions in accordance with the instructions he received? Upon questioning, did the observer report that he expected a shock during the last part of the experiment?

In the S-M condition, one observer reported that he did not think the performer was being shocked, while this report was given by eight observers in the S-NM condition. Judging from their reports, a large number of observers in the S-NM condition believed that the performer was receiving a very mild shock or no shock at all; this may account for the relatively low frequency of instigations in this condition. Many S-NM observers did not perceive that the performer was being shocked or made uncomfortable. Five observers in the NS-NM condition reported that they did not think the performer would be shocked if she touched the inductorium. The majority of observers, however, described the conditions of the experiment in accordance with the instructions given, the one major exception being the S-NM observers.

Most of the observers who reported that they expected to receive a shock during the last part of the experiment, apparently expected the shock on the first trial or two, and when it did not happen, they no longer expected to be shocked.

When the mean GSRs from observers who expected shock are compared with the general means for the relevant conditions, it appears that all means are essentially equal to or less than the general mean for the particular condition—except for the instigation mean of S-M observers. Of the two observers in the S-M condition who expected shock, one gave GSRs on 8 out of 10 conditioning trials, which is equal to the median number of responses given by observers in the S-M condition; the other observer gave GSRs on all 10 trials, which is equal to the score of one-third of the observers in the S-M condition. Of the 24 observers in each condition, 2 S-M observers, 3 S-NM observers, 5 NS-M observers, and 5 NS-NM observers reported some expectation of receiving shock. Consequently, even though a small number of observers in each condition reported that they expected to be shocked, there is nothing in their data to suggest that this is a significant factor in their GSR responsiveness.

While there is general agreement between these findings and the results of Experiment I, the differences between the S-M and NS-M conditions with respect to instigation and conditioning were not consistently as large in both studies. When the probabilities of the observed differences are considered together, there is good support for the phenomenon of conditioning through vicarious instigation. Yet, it appears that some refinements in measuring

techniques might improve the reliabilities of the differences.

EXPERIMENT III

There is some possibility that the instructions and performer reactions resensitized the observer's response to the buzzer during the second part of the experiment, so that the measures of instigation and conditioning were confounded with a resensitized response to the buzzer, per se. Furthermore, the use of only three test trials may have been insensitive to some of the conditioning that occurred. For these reasons, the measurement technique was changed to conform to the recommendations of Stewart, Stern, Winokur, and Fredman (1961), in which the latency of the GSR was used to identify response measures. By taking into account the latency of the GSR to a stimulus, these authors found it possible to obtain separate measures of responses to the CS and UCS, and to identify conditioned anticipatory responses, for each trial. With this technique, therefore, it is possible to have each presentation of the stimuli serve as a test trial for conditioning, and simultaneously obtain measures of responses to the CS and to the UCS. The purpose of this experiment was to determine the utility of the latency technique for conditioning through vicarious instigation. Only the S-M and NS-M conditions were examined in this experiment, using the same instructional procedures as reported for Experiment II.

Some procedural changes with regard to presentation of stimuli were introduced to accommodate the latency technique. During adaptation, only the buzzer was presented for 6.5 seconds. The intertrial interval was varied at random (during adaptation and conditioning) from 20 to 60 seconds. During conditioning, the buzzer was presented for the same length of time as in adaptation. The dimming of the light for 1 second followed the termination of the buzzer by .5 second. As usual, the performer jerked her arm when the light dimmed.

For scoring purposes, the stimulus interval was divided into three 4-second units.[8] The first 4-second unit represented the response to the buzzer; the last 4-second unit, measured from the end of the light dimming period, represented the response to the performer's movement; the second 4-second unit represented a conditioned anticipatory response.

The criteria for identifying GSRs was the same as used in Experiment II, except that the pen movement in the direction of lowered resistance had to occur within one of the 4-second intervals, and the movement had to indicate an accelerating change rather than a decelerating one; this latter criterion seemed necessary to distinguish GSRs initiated in one scoring period from one initiated in the next period, on a given trial. Again, scoring of the records was done independently, without identification as to which condition the observer had been assigned. The scorers agreed on 93% of the cases, and resolved their disagreements by discussion.

The performer was a female in this experiment, but not the same person who was used in Experiment II.

Sixteen subjects were assigned to each condition so that each condition contained an equal number of males and females.

The adaptation for the two conditions was quite similar. Figure 3 shows the response frequencies to the buzzer, the second, and the third scoring units for both conditions over the first four adaptation trials. Since only the buzzer was presented during adaptation, responses occurring during the second and third scoring periods are assumed to be spontaneous.

When responses to the buzzer during conditioning are compared to the buzzer responses occurring during adaptation (see Figure 3), it is apparent that observers are resensitized in the conditioning period. An analysis of variance based upon total responses

[8] The 4-second unit was used in Experiments I and II for identifying GSRs to the stimuli. It is also in agreement with the general findings of Stewart, Stern, Winokur, and Fredman (1961, p. 63).

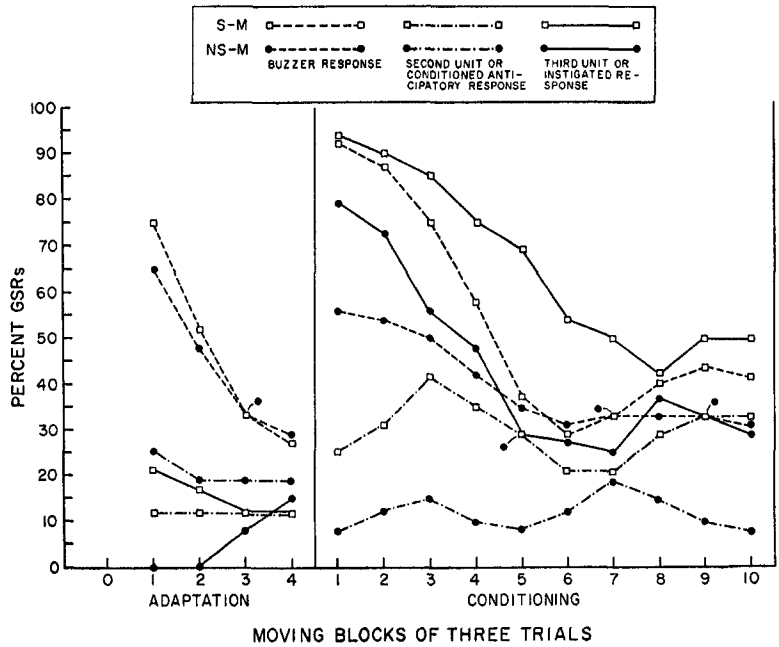

FIG. 3. Percentage of observers giving GSRs during adaptation and conditioning (Experiment III).

to the buzzer during conditioning revealed no reliable differences between the two conditions.

The curves presented in Figure 3 for instigated responses have the same general shape as the curves for the comparable conditions in the two previous studies; S-M observers are more responsive than NS-M observers. The analysis of variance based upon total instigations for each observer shows that this difference is reliable (see Table 3).

S-M observers gave more conditioned anticipatory responses than NS-M observers, as may be seen in Figure 3. The analysis of variance, summarized in Table 4, shows that the difference in conditioned anticipatory response totals for observers in the two conditions is reliable.

In this experiment, the experimenter asked each observer at the end of the experiment if he expected to receive a shock. Only one observer in each condition reported that he expected shock.

These findings provide additional support for the phenomenon of conditioning through vicarious instigation. The general level of observer instigation was similar to that found for comparable conditions in Experiment II, but a general increase in the number of conditioned GSRs was noted in Experiment III, where anticipatory re-

TABLE 3

SUMMARY OF ANALYSIS OF VARIANCE FOR INSTIGATIONS

Source	*df*	*MS*	*F*
Shock instructions	1	40.50	5.36*
Sex of observer	1	8.00	1.06
Shock × Sex	1	0.00	
Residual	28	7.77	

* $p < .05$.

TABLE 4

SUMMARY OF ANALYSIS OF VARIANCE FOR CONDITIONED ANTICIPATORY RESPONSES

Source	*df*	*MS*	*F*
Shock instructions	1	26.28	9.16*
Sex of observer	1	2.53	—
Shock × Sex	1	1.53	—
Residual	28	2.87	

* $p < .01$.

sponses were examined on all 10 trials by the latency criterion.

DISCUSSION

Considering all three studies together, there is a good deal of consistency in the findings with regard to the S-M and NS-M conditions. Although the differences between these conditions for instigations and conditioned responses was not consistently reliable in Experiments I and II, the trends in the differences were always in the same direction. With particular reference to the CR data, the finding in Experiment III that observers in both conditions are resensitized to the buzzer suggests that this factor may have tended to mitigate the reliability of the differences.

The reader may be concerned with the possibility that the differences between conditions may be influenced by different base levels of resistance, produced by the different treatments. The base levels of resistance (in ohms) were generally lower for S-M observers than for observers in the control conditions in these studies, although frequency of GSRs was greatest in the S-M condition. Since there is a positive relationship between GSR size and base level of resistance (Haggard, 1945), this would suggest that the effect of base level differences tended to decrease the differences in frequency of GSRs between the S-M and control conditions, according to the GSR criteria used. Consequently, if base level differences did influence the results of these studies, it was in the direction of minimizing vicarious instigation effects.

It should be noted that the present experimental situation *underplays* the instigation of the performer. This was done in order to keep the S-M and NS-M conditions plausible and yet comparable. Presumably, the level of instigation (and consequently, conditioning) would be higher if the performer's behavior was changed so as to provide greater evidence of pain. Actually, the present level of instigation and conditioning is high enough to provide evidence for the phenomenon, and yet low enough to provide a basis for testing the facilitating effects of a variety of variables.

In all of the data, observer GSRs tend to occur less frequently during the last half of the conditioning period than the first half. The explanation for this change is not entirely clear. One possible explanation is that GSR adaptation occurs because the observer becomes habituated to the specific situation as a result of repeated presentations of the stimuli, as Sears (1933) has shown. In addition, relatively short intertrial intervals tend to produce rapid GSR adaptation to repeated stimuli (Coombs, 1938). It also is possible that observers pay less attention to the stimuli as the experiment progresses. For example, some observers in the S-M condition reported that they could not bear to watch the performer being shocked and looked away after the first few trials; observers in the NS-M condition may have become bored with, and less attentive to, the repetitious movement.

It might also be argued that vicarious instigation phenomena have a transitory quality, the effect diminishing with successive exposures to the performer's situation as the observer be-

gins to exercise some internal controls over his ERs. An adult audience witnessing a movie, for example, may be emotionally aroused as they watch their favorite star fall off a cliff for the first time; but their level of arousal will probably be lowered after witnessing the same scene over and over again. Individuals can exercise control over their emotions when they can anticipate the occurrence of an emotionally arousing situation; although, considering the number of times a child can sit through the same movie with apparently undiminished enthusiasm, it would seem that children are less capable than adults in exercising such control.

Since it cannot be determined, from the data reported, whether the adaptation effects noted in these studies are a function of the characteristics of the GSR or a function of the characteristics of vicarious instigation phenomena generally, it would seem that a different measure of vicarious instigation is needed in order to avoid this confounding.

At the same time, some measure is needed to identify the nature of the observer's ER. While the reader may be tempted to think of these experiments as reflecting some sort of observer *empathy,* there is no basis for this interpretation. Some observers may be empathizing and some observers may be enjoying the performer's apparent pain. Research is presently underway which employs the evaluative scales of the Semantic Differential for this purpose. It may be possible to measure conditioning (as Staats & Staats, 1957, have done), with the performer's UER as the UCS for the observer. If this research is successful, it not only should provide a basis for determining how attitudes and values may be conditioned through vicarious instigation, but it should be possible to examine, independently of the GSR, whether adaptation of vicariously instigated responses occurs.

The general experimental situation used in these studies appears to be a useful one for measuring conditioning through vicarious instigation. It should be noted that the overall findings lend support to the concept of vicarious instigation as defined in the introduction to this paper: the instigation and conditioning of the observer's GSR cannot be attributed to the performer's movement, per se, or to the electrified inductorium, per se, or to the instructions concerning shock, per se. It is the apparent shock of the performer (and by inference, the performer's UER) which is the effective instigating stimulus for observer response.

Vicarious Instigation and Conditioned Emotional Response

Vicarious instigation is certainly not a new problem in social psychology. The phenomenon has been identified many times by other terminology. McDougall (1908) referred to the phenomenon as the "sympathetic induction of emotions." Floyd H. Allport (1924) reacted strongly against this instinct doctrine and sought to bring the phenomenon within the scope of conditioning theory.

> A theory far more plausible than that of instinctive induction of emotion . . . is the principle of *conditioned emotional response.* It may be illustrated by the panic which seizes all the persons in a throng when a few of them show signs of terror. Granting that the true cause for alarm has been seen by only the original few, we have here a case of fear aroused by the process of sympathy. The explanation, according to the present theory, is as follows: we have been previously terrified in company with others and so have our fear emotion transferred to characteristic attendant stimuli, such as cries and visible expressions of the emotion in those about us. We now react at once to

the sight of fear in others by a fear response of our own. Here the conception of sympathetic induction loses its force. We fear not merely because we see the expression of fear in others; but because we have learned to read these expressions as signs that *there really is something to be afraid of.* It is not fear induced from others that we experience, but *our own* fear of dangerous situations which has been conditioned by social stimuli (p. 235).

Allport's (1924) analysis argues against vicarious instigation, as defined in this paper; i.e., the expressed emotions of others are simply discriminative stimuli for subsequent presentation of the UCS to the observer. His analysis may hold for *some* situations, but it does not seem applicable to the experiments just reported. Observers were reassured that they would not be shocked, and therefore had nothing to fear for themselves; and most observers reported that they were not concerned for themselves. Furthermore, the results of the experiments show that the arousal effects are greatest for S-M observers, when the performer's situation is made to appear most unpleasant; but the number of S-M observers who apparently expected to be shocked is equal to or less than the number of observers who expected shock in the less arousing conditions.

While these arguments are not conclusive, they suggest that vicarious instigation is either a special case of conditioned emotional responding or that vicarious instigation depends upon a different learning principle. The resolution of this issue is not imminent, since further clarification of the nature of conditioned emotional responses and vicarious instigation is required before suitable arguments can be formulated.

Vicarious Instigation in Relation to Experimental Operations

The use of verbal instructions to manipulate the independent variables, and a post-experiment questionnaire to check the subject's acceptance of the instructions, limits the application of the designs used for experimental analysis of vicarious instigation to certain classes of human subjects. It is clear that these experimental operations are not appropriate for work with lower animals, young children, or with mental retardates who have little verbal facility.

One possible solution to this problem is to substitute specific training histories for the instructions. Observers first may be given direct experience with the condition that the performer will undergo, and then be exposed to a performer in that condition. Subsequently, the observer may be tested to determine if his behavior was affected by exposure to the performer. Although it seems feasible to provide different training histories for each experimental and control condition used in studies of vicarious instigation, experimental evidence is needed to demonstrate the suitability of the training technique for investigation of vicarious instigation phenomena.

To some extent, the present definition of vicarious instigation has a certain conceptual inadequacy. In order to identify conditioning through vicarious instigation, it is necessary to show that sources of pseudovicarious instigation do not account for the behavior in question. From an experimental viewpoint, the presence of a particular factor is more easily demonstrated than its absence. Until a more positive statement can be formulated concerning the necessary and sufficient conditions for vicarious instigation, it may be anticipated that the present definitions will tax the experimenter's ingenuity for setting up experimental situations which eliminate sources of the pseudoeffects mentioned previously. In spite of this inadequacy, the con-

ceptual framework has experimental value.

CONCLUSION

This paper offers a conceptualization of conditioning through vicarious instigation and provides some experimental support for the phenomenon. The importance of the problem is made evident by the paucity of experimental evidence concerning the role of the phenomena of empathy, envy, and sadism in the acquisition of interpersonal behavior. The analysis of pseudo-vicarious instigation dramatizes the inadequacy of anecdotal evidence in this area.

No systematic attention has been given here to the personality and social determinants of vicarious instigation, or to the consequences of vicariously instigated conditioning for social interaction. Heider (1958), for example, identifies a wide range of common sense principles which could be incorporated into the conditioning models presented in this paper. One of the virtues of these models is that they permit the perceptually oriented theorist to apply his principles in a conditioning framework and allow the S-R learning theorist to test his principles with a wider range of stimuli.

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